DENTAL FLOSS HOLDER

The present invention relations to a dental silk or floss holder, which is used as a tooth cleaning instrument for the cleaning of approximal dental surfaces and which brings about cleaning using the dental silk, floss, etc. and which can in particular be employed in the case of fixed dental regulating apparatus.

Dental silk or floss is used for removing food residues and dental plaque from the tooth surface and from interdental spaces, in that the floss is introduced between two teeth from occlusal to cervical and is moved along the tooth surfaces. This is an effective cleaning measure supplementing the cleaning of the teeth with toothbrushes, which are unable to clean the approximal tooth surfaces. Therefore dental floss usage prevents approximal caries and inflammation of the marginal periodontium.

In the case of orthodontic treatment using fixed apparatus, known as multi-band, bracket or brace apparatus, the inserted wire bow makes it impossible to overcome the approximal contact point with the dental floss, if the latter is held with the fingers or conventional tooth floss holders are used.

Dental floss exists having a reinforced, stiff end, which is intended to facilitate threading under the wire bow. However, its use is extremely time-consuming, requires above-average skill on the part of the user and is in particular scarcely usable for rear molars.

Conventional dental floss holders are unusable with multi-band apparatus, because between the tooth surface and papilla on the one hand, as well as the wire bow on the other insufficient space is available to permit the insertion thereof. The holder described in U.S. 5,101,843 has small feet diverging in the cervical direction and can also be used in conjunction with multi-band apparatus. However, this is a disposable product, which as a result of an excessively small, unstable grip or handle cannot be used in the side tooth region and easily breaks during use.

DE 195 17 611 C1 discloses a dental floss holder having an elongated gripping part, which at its one end is provided with a holding fork and at its other end with a spool chamber for receiving a dental floss spool. The dental floss passes from the spool

via a groove in the gripping part to the holding fork. However, this known dental floss holder suffers from the disadvantage of being very difficult to use, because the elongated gripping part is positioned between the holding fork and the spool chamber.

The problem of the present invention is to provide a dental floss holder for cleaning approximal surfaces by means of dental floss, which can also be easily used by patients using multi-band apparatus, which does not injure interdental papillae and can also be used in the rear dental arch portions without a mirror, whilst also being easy to handle.

According to the invention of this problem is solved by a dental floss holder according to claim 1.

The dental floss holder according to the invention has a grip, in which can be inserted a floss supply spool, a fork with two prongs between which can be stretched a dental floss, as well as at least one holding element for fixing the dental floss, the grip being substantially drop or tear-shaped, said grip being connected by means of an arm to the fork and in which at least one holding element is fitted to the top of the arm.

As the grip is used both for holding the dental floss holder by hand and for receiving the dental floss spool, it is possible to manufacture the dental floss holder according to the invention with a limited length, so that it is easy to handle. It can also be used with patients having multi-band apparatus. Specifically in the oral hygiene field an implement with small dimensions is very advantageous, because the human oral cavity only offers a limited space for the operation of such devices. As a result of the drop-shaped design of the grip an ergonomic holding device is created, which even permits a non-expert to reliably use the dental floss holder according to the invention.

The dental floss coming from the dental floss spool is tensioned by the at least one holding element for fixing purposes between the prongs of the fork of the dental floss holder according to the invention when the latter is in use. If only one holding element is provided, the dental floss strand from the spool and the dental floss strand returning from the fork are jointly fixed. However, it is also possible to provide several, in particular two holding elements so that the dental coming from the spool and the dental floss returning from the fork can be fixed separately. Fixing can e.g. takes place by clamping the dental floss.

According to the invention, the holding element is fitted to the arm of the dental floss holder, which links the grip to the fork. The dental floss holder arm can be

very short, i.e., have a very limited length, because it essentially only serves to fit the holding element or elements. The limited length of the arm is desirable for reasons of practical handling of the dental floss holder, as explained hereinbefore, and also from the hygienic standpoint, because the dental floss is guided on the arm surface is consequently exposed. In this connection a length of approximately 0 to approximately 7 cm has proved particularly suitable.

Preferably the grip has a shell construction. The shell construction of the grip also makes it easier to use the dental floss holder according to the invention, because it leads to a weight saving, so that the use of the dental floss holder does not tire the hand of the user if the latter carries out a careful and therefore possible long-lasting cleaning of the teeth and interdental spaces. This advantage has an advantageous effect in making children accept the dental tooth holder.

According to a particularly preferred embodiment the diameter of the drop-shaped grip is approximately 3 to approximately 7 cm. The expression "diameter of the drop-shaped grip" in the present case means the diameter of that part of the drop-shaped grip which has a substantially circular cross-section. The indicated grip size ensures a particularly comfortable handling of the dental floss holder, because it roughly corresponds to the size of the surface area comfortably grasped by the human hand. However, if a dental floss holder is to be created for specific groups of people, e.g small children, the size of the grip can be correspondingly varied, in order to adapt the product to the specific target group. Voluminous dental floss spools can be used in a grip, whose size is in the indicated range, so that there is no need to frequently change or replace the spool. Thus, in the grip of the dental floss holder according to the invention it is possible to integrate spools of virtually any size.

The fork prongs preferably have at their end a cross-section of approximately 1 to approximately 3 mmy, i.e. the prongs are highly filigree.

The fork prongs are also preferably bend downwards and outwards with respect to the longitudinal axis of the dental floss holder, which in practice means that the prongs diverge in the oral and vestibular direction. As a result of this construction a sufficiently large cleaning zone is created, but the overall fork size is relatively small. To minimize injury risks, the fork prongs have rounded ends. This additional increases comfort and safety when cleaning the interdental spaces. Through the combination with

the grip the dental floss holder can also be used in the molar area.

The shell construction of the grip can be implemented in that the grip has two parts, the first part being shell-shaped and the second part is constructed as a detachable or hinge-down lid. This protects the dental floss spool against external influences, such as e.g. dirtying.

For the secure holding of the inserted dental floss spool the grip can contain a post, which is substantially perpendicular to the longitudinal axis of the dental floss holder. The term "post" here means any elongated element on which can be engaged a dental floss spool with a central opening.

According to another embodiment the grip is provided with a resiliently mounted mechanism for locking purposes, the locking mechanism having a pin, which is operable by pressure releasing the locking action. In this embodiment the dental floss coming from the dental floss spool is initially guided over the fork prongs and only the dental floss returning from the fork is fixed to the holding element. This ensures the necessary thread tension for the cleaning process. By exerting a pressure on the pin of the mechanism the locking action is released and the dental floss can be drawn from the spool and then fixed again by releasing the pin. In this way in each case a "fresh" dental floss portion can be brought into the cleaning zone.

The resilient mounting can be implemented by a spring element and the grip preferably has securing elements for preventing the jumping out of the spring element.

The dental floss holder according to the invention is preferably provided with a cutting device for cutting off the spent dental floss. In this way the dental floss running back from the fork and which has already passed through the cleaning zone and has consequently been used for dental cleaning purposes, can be easily separated.

An embodiment of the invention is described hereinafter relative to the attached drawings, wherein show:

Fig. 1 A first embodiment of a dental floss holder for dental floss according to the invention in plan view.

Fig. 2 The dental floss holder of Fig. 1 in side view.

Fig. 3 A rear view of the grip with inserted floss supply spool of a second embodiment of the dental floss holder according to the invention in cross-section.

Fig. 1 shows in plan view a first embodiment of the dental floss or floss holder according to the invention carrying the overall reference numeral 1. The dental floss holder 1 has at its front end a fork 2, which essentially comprises two prongs 3, which are bent downwards (not visible in this representation) and sideways. This arrangement of the fork 2 facilitates to a significant extent the cleaning of side teeth. Between the prongs 3 of fork 2 extends the cleaning zone, in which the dental silk or floss passes substantially perpendicularly to the longitudinal axis of the dental floss holder, as can be seen in the drawing. The prongs 3, whose ends are rounded, prevent injuries on the marginal periodontium and secure the dental floss in positioned by a notch or the like.

The rear end of the dental floss holder is formed by a grip 4, which here comprises a first part 4a, constructed as a shell-shaped base, and a second part 4b, which can be constructed as a detachable or fold-up lid. In the shell-shaped depression of the first part 4a of the grip 4 is inserted a dental floss spool 5 during the use of the dental floss holder 1 according to the invention. In the embodiment shown here the dental floss 6 drawn from the spool 5 is supplied via a guide 7 to a holding element 8 by means of which the tension necessary for the dental cleaning process can be produced in the dental floss 6. The holding element 8 can e.g. be constructed as a clamping device, which is inserted in a bore or a groove of the dental floss holder. In the represented embodiment the holding element 8 is fitted to an arm 9 connecting the fork 2 to the grip 4.

The arm 9 is preferably very short, so that there is no effort arm between fork 2 and grip 4. According to a not shown embodiment the arm 9 can be complete omitted. In this case the holding element 8 is preferably located on the fork 2, namely on its side facing the grip 4. The inventive construction of the dental floss holder with a very short or no arm 9 adds to the already mentioned advantages the advantage that for each cleaning process only a small dental floss length is required, because the distance covered by the dental floss from the spool to the fork is short.

The guide 7 can be constructed as a depression or groove within the grip 4 and optionally on the or within the arm 9, which essentially passes along the longitudinal axis of the dental floss holder. For protecting the spool 5 and dental floss 6 against dirtying the lid is preferably designed in such a way that, when fitted, it substantially completely covers the first, shell-shaped part 4a of the grip 4 and the guide 7 located in the latter. If the guide 7 for the dental floss 6 is at the point where the lid crosses its path on

the top of the first shell-shaped part of the grip, in the manner shown here at this point the lid must have an indentation 9 so as not to impede the path of the dental floss.

From the holding element 8 the dental floss 6 passes over the first prong at right angles to the longitudinal axis of the dental floss holder to the second prong and back to the holding element 8, which ensures the tension necessary for use. For the reliable guidance of the dental floss along the prongs the latter can be provided with indentations, guide grooves, etc. for the dental floss.

In the simplest case, as shown, the holding element 8 can be constructed as a button-like element, to which the dental floss 6 is fixed by winding round. The space between the prongs 3 forms the cleaning zone of the dental floss holder according to the invention.

In order to be able to fix and center in a reliable manner within the grip 4 the dental floss spool, in part, in this case in the first, lower part 4a of the grip 4 is fitted a post 10. This construction makes it possible to so position within the depression spools 5, which are much smaller than the depression provided for receiving the spool that sliding thereof is impossible.

As a further detail of the dental floss holder 1 according to the invention, Fig. 2 shows a cutting device 11, which is here fitted to the lateral edge of the first part 4a of the grip 4 and which serves to separate or cut off immediately after use the spent dental floss. Other than in the represented embodiment, it is also possible to integrate the cutting device 11 into the holding element 8, so that the projecting parts of the thread, i.e. the dental floss, can be immediately separated or cut off. No matter where it is fitted, the cutting device 11 should be countersunk, so as to prevent injury during use.

Fig. 3 shows a cross-section through the grip 4 of a second embodiment of the dental floss holder 1 according to the invention. Here again the grip 4 comprises a first, lower part 4a, which is essentially shell-shaped, and an upper part 4b. The grip 4 is here shown in the closed state, i.e. the second part 4b or lid, which is also shell-shaped, is placed on the lower part 4a. This embodiment has a locking mechanism 12.

The locking mechanism 12 here comprises a post centrally resiliently mounted in the lower part 4a and which is operable by pressure for releasing the locking action. For this purpose through an opening or bore in the grip lid, the post projects beyond the latter. As shown in the drawing, the post 13 is widened towards its lower end

and this widening serves to secure a dental floss spool holder 14 on which is mounted the dental floss spool 5.

The post 13 can be mounted in the lower part 4a of the grip 4 by a spring element 15, shown here as a simple spiral spring. One or more securing elements 16 prevent the jumping out of the post 13 possibly initiated by the spring element 15 on removing the upper part of the grip 4. The securing elements 16 are formed in the present embodiment by a plate-like protuberance of the post 13, which outside the lower part 4a of the grip 4 engage on the latter.

If dental floss 6 is drawn from the spool 5, then the post 13 is pressed downwards counter to spring tension, so that it moves downwards along a rotation preventer 17 preventing the dental floss spool rotating in the locked position. The dental floss spool holder 14 is released unwound from the spool 5. When sufficient dental floss has been drawn off, the post 13 is released again, so that it moves upwards under the action of the spring element 15 to the extend allowed by the securing elements 16. During the upward sliding of the post 13 its widened end again engages in the dental floss spool holder 14, so that the spool 5 is again locked.

According to another, not shown embodiment the post 13 has two pins (female elements) on which is engaged a dental floss reel having two notches or recesses (male elements), so that the reel does not independently rotate without releasing the post.

The dental floss holder according to the invention can be provided with means in order to impart high frequency oscillations to the dental floss. This improves the cleaning action and makes it easier to overcome the contact point, particularly in the case of patients having bands, brackets and braces.